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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,962	03/16/2001	Atsuo Omaru	09792909-4809	7248
26263                      7590                      08/18/2008 SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080				
EXAMINER				
DOVE, TRACY MAE				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
08/18/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

09/810,962

**Applicant(s)**

OMARU ET AL.

**Examiner**

TRACY DOVE

**Art Unit**

1795

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3-5 and 15-46 is/are pending in the application.
- 4a) Of the above claim(s) 15-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C2)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 6/6/08. Applicant's arguments have been considered, but are not persuasive. Claims 1, 3-5 and 15-46 are pending with claims 15-46 being withdrawn.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/12/07 has been entered.

#### ***Claims Analysis***

The claimed invention recites the graphite in the negative electrode has a "rhombohedral structure". The specification discloses that natural graphite has a "rhombohedral structure" (page 21) and that natural graphite having a "rhombohedral structure" may be used as a starting material (page 42). Thus, in view of the teaching of the present specification, natural graphite contains a "rhombohedral structure".

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, and alternatively unpatentable over, Hayashi et al., JP 10-334915.

Hayashi teaches a rechargeable battery having an electrode comprising graphite particles. A dynamic energy process is applied to a graphite material so that the apparent density ratio between before and after the process becomes 1.1 or above. The apparent density ratio between before and after the process equals the tap density after the process/tap density before the process, and this is to become the index of sphericity. See abstract.

The intensity ratio R of a Raman spectrum is preferably 0.4 or less. In the Raman spectrum analysis, the intensity IA of peak PA near  $1580\text{ cm}^{-1}$  and the intensity IB of peak PB near  $1360\text{ cm}^{-1}$  were measured (0035). Therefore,  $R=IB/IA=H_{sd}/H_{sg}$  and  $H_{sg}/H_{sd}=1/R=G_s$ . Since R is 0.4 or less, Hayashi teaches  $G_s$  is 2.5 or more.

The tap density ratio before and after processing is 1.7 or greater, more preferably 1.1 or greater. It is desirable to have a tap density after processing of 0.5-2 g/cc (see page 4, paragraph 0023-0024). The tap density of the graphite material is preferably in the range of 0.7-1.2 g/cc (see page 7, paragraph 0042). The true density of the graphite material is 2.25 g/cc or more (claim 2). Thus a packing characteristic index (tap density/true density) of Hayashi may be 0.53 ( $1.2/2.25$  = tap density/true density).

The specific surface area of the graphite particles after processing (pulverizing) is below  $25 \text{ m}^2/\text{g}$  and more than  $0.5 \text{ m}^2/\text{g}$ , preferably  $2\text{-}10 \text{ m}^2/\text{g}$  (0035). Table 4 shows different graphite material properties before and after a dynamic energy process/treatment. The SA in Table 4 represents surface area with the surface area of the graphite being  $19.1 \text{ m}^2/\text{g}$  before treatment and  $8.9 \text{ m}^2/\text{g}$  after treatment (Example 13). The surface area after treatment is 2.1 times that before treatment. The energy process is specifically pulverization. Hayashi teaches a surface area of the graphite being  $4.5 \text{ m}^2/\text{g}$ ,  $4.8 \text{ m}^2/\text{g}$ ,  $8.7 \text{ m}^2/\text{g}$  or  $19.1 \text{ m}^2/\text{g}$  before treatment (Table 4) and preferably  $2\text{-}10 \text{ m}^2/\text{g}$  after treatment (0035). Hayashi teaches an electrode having a graphite material with a (d002) distance between layers of  $0.34\text{nm}$  or less (claim 2).

Hayashi teaches natural graphite of high orientation/high crystallinity is used (0013-0014). High crystallinity natural graphite is known to have a rhombohedral structure (diamond structure). Hayashi teaches the natural graphite may be subjected to a surface grinding process (0029). Natural graphite has a rhombohedral structure (as stated in the present specification, see above).

Hayashi does not explicitly recite the graphite material has at least two peaks on a differential thermogravimetric curve. However, the graphite material of Hayashi inherently has at least two peaks on a differential thermogravimetric curve because the graphite material of Hayashi has a Raman spectrum having two distinct signal peaks. The two distinct signal peaks on the Raman spectrum indicate the graphite material contains two distinct carbon materials. A graphite material having two distinct carbon materials would inherently provide at least two peaks on a differential thermogravimetric curve.

Thus the claims are anticipated. The claims are alternatively unpatentable. Hayashi does not explicitly state the weight rejection as measured by DTG, is at least 5% and at most 40%. However, the limitation is a product-by-process limitation, which is not given patentable weight in the absence of unexpected results.

### ***Response to Arguments***

Applicant's arguments filed 6/6/08 have been fully considered but they are not persuasive. Applicant argues Hayashi fails to teach "the weight reduction as measured by DTG is at least 5% and at most 40%" as required by the claimed invention. However, the limitation is a product-by-process limitation, which is not given patentable weight in the absence of unexpected results. Applicant asserts the limitation is not a product-by-process limitation, but the limitation is describing a particular property. However, a TG curve obtained by TG analysis shows combustion temperature dependency of the proportion of weight reduction. Therefore, a TG curve (or DTG curve) shows the combustion process of the graphite particles (0033).

Applicant argues Hayashi appears to teach "spherical" as the preferred particle shape. Examiner disagrees and requests Applicant identify the section of Hayashi that "appears to teach" this preferred embodiment. Applicant states the specification describes in paragraph 0071 that natural graphite can be milled to achieve the rhombohedral structure. Examiner points out that Hayashi teaches the natural graphite may be subjected to a surface grinding process (milling) (0029). Furthermore, the claim language "rhombohedral structure" was interpreted by the Examiner as early as 10/19/04 wherein Examiner stated natural graphite contains a rhombohedral structure, as described in the present specification. Applicant has prosecuted this Application for almost four years without challenging this interpretation.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 14, 2008

/TRACY DOVE/

Primary Examiner, Art Unit 1795